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| 09/673,143      | 10/11/2000  | Madeleine Prigent    | Q60989              | 9530             |

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EXAMINER

MAYO III, WILLIAM H

ART UNIT PAPER NUMBER

2831

DATE MAILED: 08/14/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/673,143

Applicant(s)

PRIGENT ET AL.

Examiner

William H. Mayo III

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 27 July 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 11, 2002, has been entered.
2. The indicated allowability of claims 10 & 12 is withdrawn in view of the newly discovered reference(s) to Spendal et al (Pat Num 5,246,783) and Maxfield et al (Pat Num WO 93/04117). Rejections based on the newly cited reference(s) follow. The examiner apologizes for any inconvenience this may cause.

### ***Specification***

3. The abstract of the disclosure is objected to because it contains the term "comprising" in line 1, which is improper language for the abstract. The applicant should replace the term with —having—.

Correction is required. See MPEP § 608.01(b).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spendal et al (Pat Num 5,246,783, herein referred to as Spendal) in view of Maxfield et al (Pat Num WO 93/04117, herein referred to as Maxfield). Spendal discloses power cable (Figs 4a-4b) comprising at least one covering layer (Col 10, lines 63-68). Specifically, with respect to claim 1, Spendal discloses a power cable (Fig 4a) comprising a conductive material core (denoted as conductor) and at least one covering layer (denoted as inner and outer semiconductor shields and insulation) wherein the at least one covering layer (denoted as inner and outer semiconductor shields) may comprise an inorganic compound (i.e. carbon black & clay, Col 10, lines 20-28) of sheet

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structure (Fig 4a) and an organic compound (i.e. polyethylene, denoted as insulation layer) inserted between the layers (inner and outer semiconductor layers) of inorganic compound (i.e. carbon black and clay). With respect to claim 2, Spendal discloses inorganic compounds (i.e. carbon black & clay), which are inorganic oxides. With respect to claim 3, Spendal discloses that the inorganic oxide may be clay, such as kaolin (Col 10, lines 20-23). With respect to claim 5, Spendal discloses that the organic compound, may be polyethylene (Col 9, lines 1-2), which is a polymer. With respect to claim 6, Spendal discloses that the polymer may be selected from a group of polyolefin (i.e. polyethylene is a polyolefin). With respect to claim 8, Spendal discloses that the at least one covering layer (Fig 4a) comprises an insulative layer (denoted as insulation, Col 11, lines 10-13) that may comprise an inorganic compound (i.e. carbon black & clay) of sheet structure (Fig 4a) and an organic compound (polyethylene) inserted between the layers (semiconductive layers) of inorganic compound (i.e. carbon black & clay). With respect to claim 9, Spendal discloses that the at least one covering layer (Fig 4a) comprises an jacket layer (i.e. external cover layer denoted as jacket, Col 11, lines 10-13) that may comprise an inorganic compound (i.e. carbon black & clay) of sheet structure (Fig 4a) and an organic compound (polyethylene) inserted between the layers (semiconductive layers) of inorganic compound (i.e. carbon black & clay). With respect to claim 10, Spendal discloses that the at least one covering layer (Fig 4a) comprises an semiconductive screen (denoted as semiconductive layer, Col 8, lines 48-60) that may comprise an inorganic compound (i.e. carbon black & clay, Col 10, lines 20-25) of sheet structure (Fig 4a) and an organic compound (polyethylene) inserted

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between the layers (semiconductive layers) of inorganic compound (i.e. carbon black & clay). With respect to claim 11, Spendal discloses a method of fabricating a power cable (Fig 4a) including the steps providing the inorganic compound (i.e. carbon black & clay) and combining it with an organic compound (i.e. polyethylene), inserting the organic compound (i.e. polyethylene) between the layers (semiconductor layers) of containing the inorganic compounds (carbon black & clay) at a temperature higher than the temperature at which the organic compound (polyethylene) soften or melts (i.e. extrusion process, Col 10, lines 5-10) and obtaining a material (insulation layer) with an organic compound (i.e. polyethylene) between the semiconductive layers containing the inorganic compound (i.e. carbon black & clay). With respect to claim 15, Spendal discloses that the at least one covering layer (Fig 4a) comprises an semiconductive screen (denoted as semiconductive layer, Col 8, lines 48-60) that may comprise an inorganic compound (i.e. carbon black & clay, Col 10, lines 20-25) of sheet structure (Fig 4a) and an organic compound (polyethylene) inserted between the layers (semiconductive layers) of inorganic compound (i.e. carbon black & clay). With respect to claim 17, Spendal discloses that the at least one covering layer (Fig 4a) comprises an insulative layer (denoted as insulation, Col 11, lines 10-13) that may comprise an inorganic compound (i.e. carbon black & clay) of sheet structure (Fig 4a) and an organic compound (polyethylene) inserted between the layers (semiconductive layers) of inorganic compound (i.e. carbon black & clay), which is surrounded by an external covering layer (denoted as semiconductive layer, Col 8, lines 48-60) that may comprise an inorganic compound (i.e. carbon black, Col 10, lines 20-25) of sheet structure (Fig

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4a) and an organic compound (polyethylene) inserted between the layers (semiconductive layers) of inorganic compound (i.e. carbon black & clay).

However, Spendal doesn't necessarily disclose the inorganic compound being made from nanocomposite material (claims 1, 8, 9, 13), nor the inorganic compound being an inorganic oxide being clay chosen from montmorillonite or bentonite (claim 4), nor the polymer being selected from epoxy resin, polyester, polyamide, polyimide, polyetherimide, polyamide, polyurethane, silicone, or a mixture thereof (claim 7), nor the inorganic compound being a clay and said compatibilizing agent being selected from quaternary ammonium salt, an oxide of polyethylene, and a phosphorus containing derivative (claims 12 & 16), nor the material having a particle size equal to 1 nanometer (claim 14), nor the method of treating layers of inorganic compound with an agent to render it compatible with an organic compound while exfoliating the inorganic compound (claims 11, 15, & 17).

Maxfield teaches a polymeric nanocomposite composition that may be used as an molded article for electrical devices (Page 35, lines 31-35) and that exhibits improved properties over the monomer blending and polymerizing processes of the prior art (Page 3, lines 8-10), such as improved tensile yield strength, tensile modulus and/or ultimate elongation (Page 6, lines 1-4), greater mechanical reinforcement to polymer matrixes and imparts lower permeability to polymers (Pages 2-3, lines 37 & 1-7). Specifically, with respect to claim 1, Maxfield teaches that the flowable mixture comprising a polymer containing an inorganic material that has an inorganic compound being made from nanocomposite material (abstract). With respect to claim 4, Maxfield

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teaches that the inorganic compound may be an inorganic oxide such as montmorillonite clay (Page 10, lines 25-32). With respect to claim 7, Maxfield teaches that the organic material may be a polymer such as polyester, polyamide, polyetherimide, polyurethane (all cited on Page 26), and silicone, or a mixture thereof (cited on Page 27). With respect to claim 8, Maxfield teaches that the flowable mixture comprising a polymer containing an inorganic material that has an inorganic compound being made from nanocomposite material (abstract). With respect to claim 9, Maxfield teaches that the flowable mixture comprising a polymer containing an inorganic material that has an inorganic compound being made from nanocomposite material (abstract). With respect to claim 11, Maxfield teaches method of forming at least one layer comprising treating the layers of an inorganic compound, such as clay, with an agent (i.e. swelling/compatibilizing agents) to render the inorganic material compatible (Pages 1 & 2, lines 36-37 & 1-4), wherein an organic compound (i.e. polymer) is inserted between the inorganic materials at a temperature higher than the temperature at which the organic compound (i.e. polymer) softens or melts to exfoliate the inorganic compound (Pages 7-8, lines 31-36 & 1-2, respectively). that the nanocomposite material With respect to claim 12, Maxfield teaches that the inorganic compound may be a clay and a compatibilizing agent being selected from quaternary ammonium complexes (i.e. salts, Page 39, lines 31). With respect to claim 13, Maxfield teaches that the flowable mixture comprising a polymer containing an inorganic material that has an inorganic compound being made from nanocomposite material (abstract). With respect to claim 14, Maxfield teaches that the organic material has a particle size that



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may be less than 50 Å (i.e. less than 5 nanometers. With respect to claim 15, Maxfield teaches that the nanocomposite material comprises an exfoliated inorganic compound (Pages 7-8, lines 31-36 & 1-2, respectively). With respect to claim 16, Maxfield teaches a method such that the inorganic compound may be clay and a compatibilizing agent being selected from quaternary ammonium complexes (i.e. salts, Page 39, lines 31). With respect to claim 17, Maxfield teaches that the nanocomposite material comprises an exfoliated inorganic compound (Pages 7-8, lines 31-36 & 1-2, respectively).

With respect to claims 1, 4, 8-9, and 11-17, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the polymeric composition of Spendal to comprise a nanocomposite composition as taught by Maxfield because Maxfield teaches that such a polymeric nanocomposite composition that may be used as an molded article for electrical devices (Page 35, lines 31-35) and that exhibits improved properties over the monomer blending and polymerizing processes of the prior art (Page 3, lines 8-10), such as improved tensile yield strength, tensile modulus and/or ultimate elongation (Page 6, lines 1-4), greater mechanical reinforcement to polymer matrixes and imparts lower permeability to polymers (Pages 2-3, lines 37 & 1-7).

### ***Response to Arguments***

7. Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

**Conclusion**

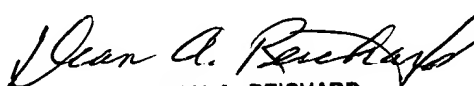
8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. They are Michalczyk et al (Pat Num 5,726,247), which discloses nanocomposite materials, Jackson et al (Pat Num 5,198,512), Smith et al (Pat Num 6,238,790), Reid et al (Pat Num 6,086,792), and Weil et al (Pat Num 5,578,666), all of which disclose polymer composites for usage with power cables.

**Communication**

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to William H. Mayo III whose telephone number is (703) 306-9061. The examiner can normally be reached on M-F 8:30 a. m.-6:00 p.m.(alternating Friday's off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard can be reached on (703) 308-3682. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3432 for regular communications and (703) 305-1341 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

 8/12/02  
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